Image Challenge – Acute shortness of breath with widespread T wave inversion.

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Case History

A 72 year old woman presented with sudden onset shortness of breath. There was no associated chest pain, nausea or sweating. She had had breast cancer 14 years previously, treated by wide local excision, radiotherapy and tamoxifen. She gave no previous history of cardiac or pulmonary disease and had no current risk factors for venous thromboembolism. On examination she had good air entry to both lungs and normal breath sounds. Heart rate was 88/min with BP 133/73mmHg. Her SpO_2 on air was 92-95% at rest. She had no lower limb swelling or tenderness. Revised Geneva score was 4 suggesting moderate clinical probability of PE. There was no suggestion of recurrent breast cancer clinically. Haemoglobin was 145g/l, renal function was normal and CRP was 9mg/l (0-10). NT-proBNP was raised at 1158pg/ml (0-150). Her CXR was normal and her ECG is shown below (figure 1).

Discussion:

The ECG in our patient's case shows right ventricular strain. This is associated with higher clot load in acute pulmonary embolism (APE) (1) and with higher mortality and greater risk of clinical deterioration (2). Acute coronary syndrome (ACS) can also cause T wave inversion (TWI) but in ACS with TWI in leads V1-V4 it would be unusual to find TWI in leads III and aVF as well (3). RV strain pattern is not pathognomonic for APE as it can also occur in patients with chronic respiratory disease (4). However its presence in an acutely breathless patient with no previous respiratory disease and a normal CXR must make APE extremely likely. The doctor who first saw the patient considered APE, prescribed dalteparin and confirmed the diagnosis by CTPA the following day (figure 2). The patient was anticoagulated with dalteparin and warfarin and was much improved when seen at the clinic 4 weeks later. No further investigations were undertaken to determine the source of the embolism. She remained well at her last clinic review 18 months after her initial presentation.

Teaching point

Patients with acute shortness of breath, no previous cardiorespiratory disease, hypoxaemia, normal CXR and RV strain pattern on their ECG should be treated as APE until proven otherwise.

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Figure 1.

Initial ECG. RV strain is recognised by the simultaneous presence of TWI in V1-4, III and aVF

Figure 2.

CTPA. Acute pulmonary embolism with clots in both pulmonary arteries extending to all lobar branches (arrowed).

Competing interests

We have read and understood BMJ policy on declaration of interests and declare that we have no competing interests.

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Contributorship

CI had the idea, RB wrote the first draft and both authors contributed to the final draft.

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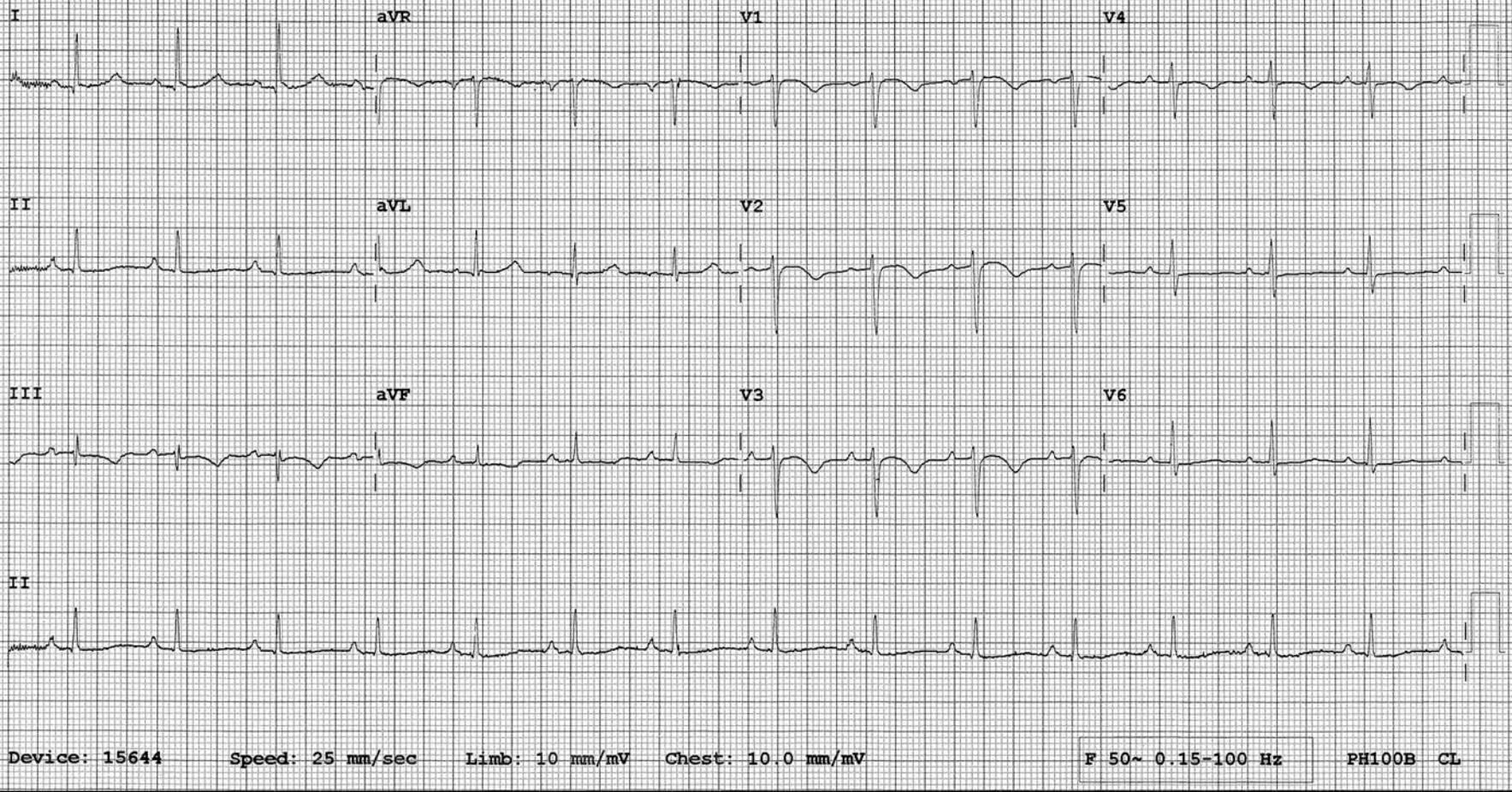
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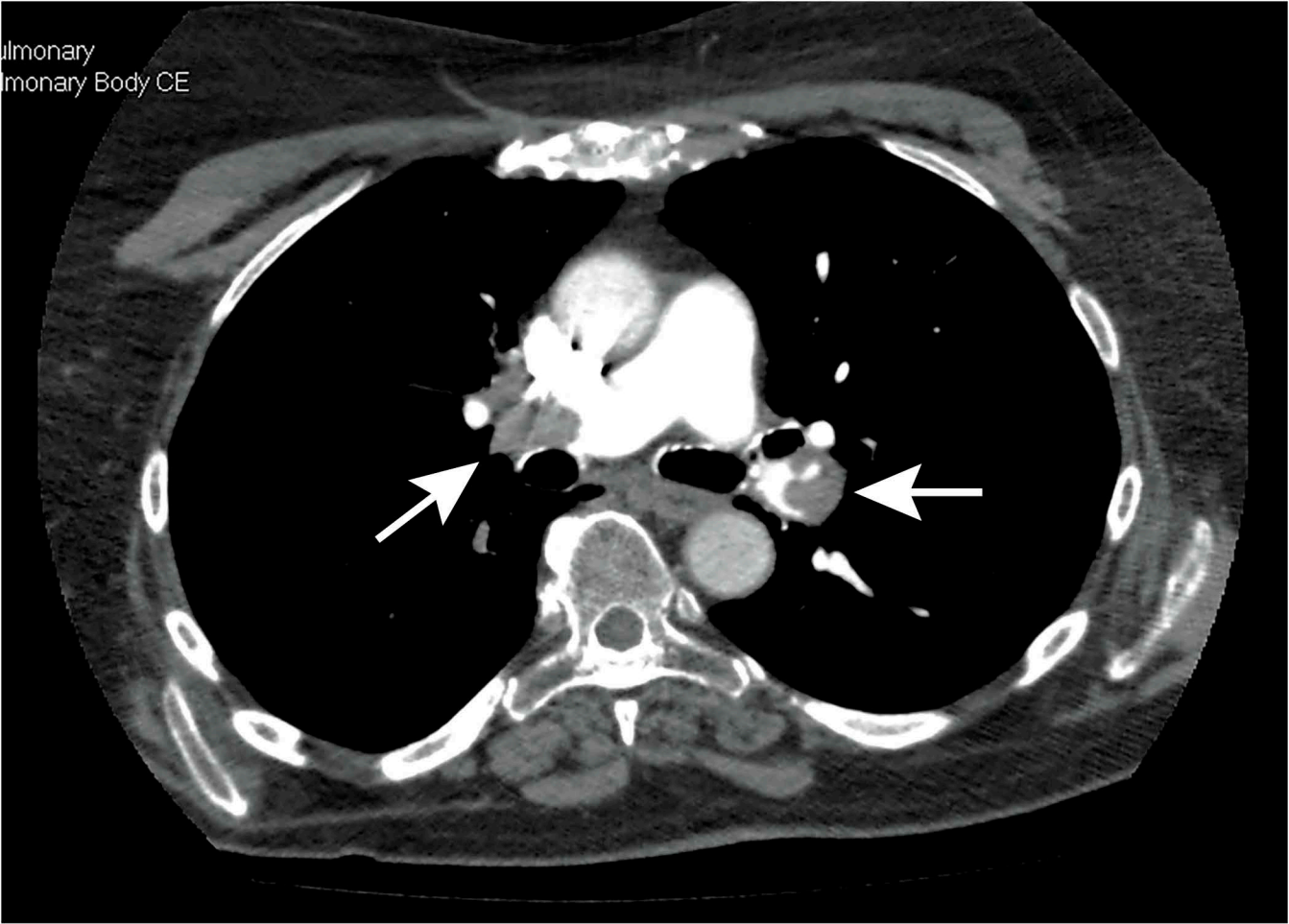
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